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TITLE: Fine pattern prodn with high resolution using simplified efficient method - by applying first photoresist, silylating and glassifying surface, making mask with second resist layer and etching down to

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ABSTRACT:

Prod. of a fine pattern comprises the stages: (1) coating a process substrate (I) with photoresist (II) to form a first resist layer (III) and silylation of the surface to form a silylated layer (IV); (2) glassifying (V) with O₂ to form a glassified layer (V); (3) coating (V) with (II) to form a second resist layer (VI); (4) selective exposure and development of (VI) in a given pattern; and (5) etching (V) and (III), using (VI) as mask. ADVANTAGE - Prod. of a fine pattern is simplified and the productivity is increased, since (V) is used as intermediate layer. The resolution is high. In an example, a Si wafer (1) was coated with chemically amplified resist (2). This was silylated in gas or aq. phase to form a 2000-3000 Å thick silylation layer (21) and glassified with O₂ (22) in RIE appts., forming a glassified layer (23) of SiO_x in the organic material. A second resist layer (4) was applied, exposed with UV light (5) through a photomask (6) and developed. The glassified layer was etched with 100 Ncc O₂/min at an energy of 2 kW, then the first resist was etched in 25Ncc CF₄/min + 60 Ncc O₂/min at 2kW in the same appts.

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